



[4910-13-P]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2020-0687; Project Identifier AD-2020-00571-E]**

**RIN 2120-AA64**

**Airworthiness Directives; Rolls-Royce Corporation (Type Certificate previously held by Allison Engine Company) Turboprop Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** The FAA proposes to adopt a new airworthiness directive (AD) for all Rolls-Royce Corporation (RRC) AE 2100A, AE 2100D2, AE 2100D2A, and AE 2100P model turboprop engines. This proposed AD was prompted by a report of a propeller gearbox (PGB) development test conducted by the manufacturer, in which high vibration occurred due to a fatigue crack that initiated in the PGB shaft and carrier assembly. This proposed AD would require assignment of usage hours to the PGB shaft and carrier assembly at the next engine shop visit and replacement of PGB shaft and carrier assemblies prior to exceeding the new life limits established by the manufacturer. The FAA is proposing this AD to address the unsafe condition on these products.

**DATES:** The FAA must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <https://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.

- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this NPRM, contact Rolls-Royce Corporation, 450 South Meridian Street, Mail Code NB-01-06, Indianapolis, IN 46225; phone: 317-230-1667; email: CMSEindyOSD@rolls-royce.com; internet: www.rolls-royce.com. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call 781-238-7759.

### **Examining the AD Docket**

You may examine the AD docket on the internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0687; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, any comments received, and other information. The street address for Docket Operations is listed above. Comments will be available in the AD docket shortly after receipt.

**FOR FURTHER INFORMATION CONTACT:** Kyri Zaroyiannis, Aerospace Engineer, Chicago ACO Branch, FAA, 2300 East Devon Avenue, Des Plaines, IL 60018; phone: 847-294-7836; fax: 847-294-7834; email: kyri.zaroyiannis@faa.gov.

### **SUPPLEMENTARY INFORMATION:**

#### **Comments Invited**

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2020-0687; Project Identifier AD-2020-00571-E” at the

beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this NPRM because of those comments.

Except for Confidential Business Information as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to <https://www.regulations.gov>, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this proposal.

### **Confidential Business Information**

Confidential Business Information (CBI) is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to Kyri Zaroyiannis, Aerospace Engineer, Chicago ACO Branch, FAA, 2300 East Devon Avenue, Des Plaines, IL 60018. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

### **Background**

The FAA was informed by the manufacturer that a PGB development test was stopped due to high vibration that was found to have been caused by a fatigue crack that

initiated in PGB shaft and carrier assembly. The fatigue crack initiated in a broach slot of the PGB shaft. The PGB shaft and carrier assembly has not previously been a life limited part. After further stress and life analyses, the manufacturer identified the need to declare life limits for all PGB shaft and carrier assemblies. The manufacturer also determined the need to assign usage hours to PGB shaft and carrier assemblies that already have time in service. This AD requires assignment of usage hours to these PGB shaft and carrier assemblies and requires removal of these parts prior to exceeding the new life limits established by the manufacturer. This condition, if not addressed, could result in loss of the propeller, damage to the engine, and damage to the airplane.

#### **FAA's Determination**

The FAA is issuing this NPRM because the agency has determined that the unsafe condition described previously is likely to exist or develop in other products of the same type design.

#### **Service Information Incorporated by Reference under 1 CFR part 51**

The FAA reviewed RRC Alert Service Bulletin (ASB) AE 2100A-A-72-322 / AE 2100P-A-72-047, Revision 1 (single document), dated May 11, 2018, and RRC ASB AE 2100D2-A-72-111 / AE 2100D3-A-72-313 / AE 2100J-A-72-111, Revision 1 (single document), dated May 28, 2018. RRC ASB AE 2100A-A-72-322 / AE 2100P-A-72-047 describes procedures for assigning usage hours to the PGB shaft and carrier assemblies on RRC AE 2100A and AE 2100P model engines. RRC ASB AE 2100D2-A-72-111 / AE 2100D3-A-72-313 / AE 2100J-A-72-111 describes procedures for verifying the PGB shaft and carrier assembly serial numbers and assigning usage hours to the PGB shaft and carrier assemblies on RRC AE 2100D2 and AE 2100D2A model engines. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

### **Other Related Service Information**

The FAA reviewed Task 05-10-00-800-801 of RRC AE 2100A Engine Maintenance Manual (MM) CSP31005, Revision 57, dated August 15, 2019, and Task 05-12-11-800-802 of RRC AE 2100A Engine MM CSP31005, Revision 57, dated August 15, 2019. Task 05-10-00-800-801 of RRC AE 2100A Engine MM provides information for determining the usage hours and engine cycles for each life-limited part on RRC AE 2100A model engines. Task 05-12-11-800-802 of RRC AE 2100A Engine MM specifies the PGB shaft and carrier assembly life limits.

The FAA reviewed Task 05-11-00-800-801 of RRC AE 2100D2 and AE 2100D2A Engine MM CSP34081, Revision 64, dated June 1, 2020, and Task 05-12-11-800-802 of RRC AE 2100D2 and AE 2100D2A Engine MM CSP34081, Revision 64, dated June 1, 2020. Task 05-11-00-800-801 of RRC AE 2100D2 and AE 2100D2A Engine MM provides information for determining the usage hours and engine cycles for each life-limited part on RRC AE 2100D2 and AE 2100D2A model engines. Task 05-12-11-800-802 of RRC AE 2100D2 and AE 2100D2A Engine MM specifies the PGB shaft and carrier assembly life limits.

The FAA reviewed Task 05-10-00-800-801 of RRC AE 2100P Engine MM CSP31015, Revision 15, dated May 15, 2018, and Task 05-12-11-800-802 of RRC AE 2100P Engine MM CSP31015, Revision 15, dated May 15, 2018. Task 05-10-00-800-801 of RRC AE 2100P Engine MM provides information for determining the usage hours and engine cycles for each life-limited part on RRC AE 2100P model engines. Task 05-12-11-800-802 of RRC AE 2100P Engine MM specifies the PGB shaft and carrier assembly life limits.

### **Proposed AD Requirements in this NPRM**

This proposed AD would require assignment of usage hours to the PGB shaft and carrier assembly at the next engine shop visit and replacement of PGB shaft and carrier assemblies prior to exceeding the new life limits established by the manufacturer.

### **Differences Between this Proposed AD and the Service Information**

RRC ASB AE 2100D2-A-72-111 / AE 2100D3-A-72-313 / AE 2100J-A-72-111, Revision 1 (single document), includes RRC AE 2100J model turboprop engines with PGB shaft and carrier assemblies, with part numbers 23088595 and 23089419 installed, in its applicability. This proposed AD does not. The FAA determined that the PGB shaft and carrier assemblies for these model engines have already been removed for rework and therefore this proposed AD does not apply to them.

### **Costs of Compliance**

The FAA estimates that this AD, as proposed, would affect 18 engines installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this proposed AD:

#### **Estimated costs**

<b>Action</b>	<b>Labor Cost</b>	<b>Parts Cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
Assign usage hours to PGB shaft and carrier assembly	3 work-hours x \$85 per hour = \$255	\$0	\$255	\$4,590
Remove and replace PGB shaft and carrier assembly	15 work-hours x \$85 per hour = \$1,275	\$49,952	\$51,227	\$922,086

### **Authority for this Rulemaking**

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by

prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

### **Regulatory Findings**

The FAA determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Would not affect intrastate aviation in Alaska, and
- (3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

### **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

### **The Proposed Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

### **PART 39 - AIRWORTHINESS DIRECTIVES**

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **§ 39.13 [Amended]**

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

**Rolls-Royce Corporation (Type Certificate previously held by Allison Engine Company):** Docket No. FAA-2020-0687; Project Identifier AD-2020-00571-E.

**(a) Comments Due Date**

The FAA must receive comments by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE Federal Register].

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to all Rolls-Royce Corporation (RRC) (Type Certificate previously held by Allison Engine Company) AE 2100A, AE 2100D2, AE 2100D2A, and AE 2100P model turboprop engines.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7210, Turbine Engine Reduction Gear.

**(e) Unsafe Condition**

This AD was prompted by a report of a propeller gearbox (PGB) development test in which high vibration occurred due to a fatigue crack that initiated in the propeller shaft. The FAA is issuing this AD to prevent loss of the propeller. The unsafe condition, if not addressed, could result in damage to the engine and damage to the airplane.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Required Actions**

(1) No later than the next shop visit for the engine with the PGB, or the next shop visit for the PGB only, whichever shop visit occurs first after the effective date of this AD, assign usage hours to the installed PGB shaft and carrier assembly using RRC Alert Service Bulletin (ASB) AE 2100A-A-72-322 / AE 2100P-A-72-047, Revision 1 (single



document), dated May 11, 2018, or RRC ASB AE 2100D2-A-72-111 / AE 2100D3-A-72-313 / AE 2100J-A-72-111, Revision 1 (single document), dated May 28, 2018.

(2) After the effective date of this AD, before exceeding the life limit (usage hours) specified in Table 1 to paragraph (g)(2) (“Table 1”) of this AD, remove the PGB shaft and carrier assembly, identified by part numbers (P/Ns) in Table 1, from service and replace with a part eligible for installation.

**Table 1 to Paragraph (g)(2) – Life Limits**

<b>Engine model</b>	<b>PGB Shaft and Carrier Assembly P/Ns</b>	<b>Life limit (usage hours)</b>
AE 2100A	23056553, 23061011, 23088746, 23088595, 23087076, 23087077, 23089419, 23088757, 23092770, 23092769	100,000
AE 2100P	23056553, 23061011, 23088746, 23088595, 23087076, 23087077, 23089419, 23088757, 23092770, 23092769	100,000
AE 2100D2/D2A	23061011, 23088746, 23088595, 23087076, 23087077, 23089419, 23088757, 23092770, 23092769	30,000

**(h) No Reporting Requirement**

The reporting requirements in RRC ASB AE 2100A-A-72-322 / AE 2100P-A-72-047, Revision 1 (single document), dated May 11, 2018, and RRC ASB AE 2100D2-A-72-111 / AE 2100D3-A-72-313 / AE 2100J-A-72-111, Revision 1 (single document), dated May 28, 2018, are not required by this AD.

**(i) Credit for Previous Actions**

You may take credit for assigning the usage hours required by paragraph (g) of this AD if you performed the action before the effective date of this AD using RRC ASB AE 2100A-A-72-322 / AE 2100P-A-72-047, original issue (single document), dated January 15, 2018, or RR AE 2100D2-A-72-111 / AE 2100D3-A-72-313 / AE 2100J-A-72-111, original issue (single document), dated January 15, 2018.

**(j) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, Chicago ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (k)(1).

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

**(k) Related Information**

(1) For more information about this AD, contact Kyri Zaroyiannis, Aerospace Engineer, Chicago ACO Branch, FAA, 2300 East Devon Avenue, Des Plaines, IL 60018; phone: 847-294-7836; fax: 847-294-7834; email: kyri.zaroyiannis@faa.gov.

(2) For service information identified in this AD, contact Rolls-Royce Corporation, 450 South Meridian Street, Mail Code NB-01-06, Indianapolis, IN 46225; phone: 317-230-1667; email: CMSEindyOSD@rolls-royce.com; internet: www.rolls-royce.com. You may view this referenced service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call 781-238-7759.

Issued on August 5, 2020.

Lance T. Gant, Director,  
Compliance & Airworthiness Division,  
Aircraft Certification Service.

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